

L-07

Probability & Statistics.

Poisson distribution

$$f(x) = \frac{\lambda^x e^{-\lambda}}{x!},$$

$$x = 0, 1, 2, \dots$$

mgf:

$$M(t) = E(e^{tx}) = e^{-\lambda} \sum_{x=0}^{\infty} \frac{(\lambda e^t)^x}{x!}$$

$$= e^{\lambda(e^t - 1)}$$

Then.

$$\mu = M'(0) = \lambda$$

$$\begin{aligned} \sigma^2 &= M''(0) - [M'(0)]^2 \\ &= \lambda \end{aligned}$$